



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,446	04/20/2004	Sanjeev Aggarwal	TI 36296	4009
23494	7590	11/15/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265				CRANE, SARA W
		ART UNIT		PAPER NUMBER
		2811		

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/828,446	AGGARWAL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sara W. Crane	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

- 1) Responsive to communication(s) filed on 06 September 2006.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

- 4) Claim(s) 1-8, 10, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-8, 10, 21 and 22 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-8, 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Ko et al., and further in view of Nishihara et al., Hideki, and Jia et al.

See reasons of record in the Office action of 6 April 2006. With respect to claims 1-3 and 5, as noted in that Office action, Inoue et al. teaches a lower electrode for a PZT-based capacitor comprising an Ir adhesion layer (column 5, line 10) and an overlying iridium oxide layer (column 5, line 13). Ko is a similar teaching. Nishihara et al. teaches at column 27, lines 50-55 that  $\text{SrIrO}_3$  or  $\text{SrRuO}_3$  are alternate electrode materials to iridium oxide for a PZT-based capacitor (column 26, line 31). Hideki teaches that these materials are conductive materials with oxidation resistance (paragraph spanning columns 6 and 7). It would have been obvious to use one of these materials instead of iridium oxide in the device of Inoue et al., to obtain desirable conductivity and oxidation resistance. Hideki notes at column 7, line 11, that these materials are of perovskite structure, as is PZT (column 5, line 36, of Inoue et al.) so the crystal structure is the same.

With respect to claim 4, Jia et al. teaches at column 4, lines 53-55 that  $\text{SrRuO}_3$  is a distorted perovskite. With respect to claim 6, it would have been obvious to use, for example,  $\text{CaRuO}_3$  as an alternative electrode layer material, because Hideki notes that

this material has conductivity and oxidation resistance, desirable properties for an electrode. With respect to claims 7-8, absent any showing of criticality, it would have been obvious to optimize thickness and resistivity of electrode material, because the electrode has to conduct electricity well, and it has to fit within the device as well. With respect to claim 10, the Inoue top electrode also has the same type of structure as the bottom electrode. With respect to claim 21, as noted previously the cover figure of Inoue et al. shows a transistor.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 20 above, and further in view of Goo et al.

Nickel silicide layers for lowering contact resistance would have been obvious in view of Goo et al. (column 8, claim 8, for example).

### ***Conclusion***

Applicant argues with respect to the Hideki reference that the materials taught in that reference are not used as electrode layers in the final device (although the Hideki materials are used as templates for growth of the capacitor dielectric). This reference also teaches properties of the materials, as relied upon above, as well as the crystal structure (perovskite). Desirable properties can motivate the combination of teachings. The Nishihara reference was also cited to show the oxide materials used as capacitor electrode layers.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (571) 272-1652.

The supervisor for Art Unit 2811, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Sara W. Crane*  
Sara W. Crane  
Primary Examiner  
Art Unit 2811